

ELECTRICAL SPECIFICATIONS:

1.

SCOPE OF WORK: PROVIDE SUPERVISION, LABOR, MATERIAL, EQUIPMENT, MACHINERY, PLANT AND OTHER ITEMS NECESSARY FOR A COMPLETE AND OPERABLE ELECTRICAL SYSTEM.
2.

STANDARDS AND CODES: THE MATERIALS AND EQUIPMENT SHALL BE NEW AND LISTED BY UNDERWRITERS LABORATORIES, INC. THE INSTALLATION SHALL BE IN ACCORDANCE WITH THE 2012 VIRGINIA UNIFORM STATEWIDE BUILDING CODE (USBC); THE 2012 INTERNATIONAL BUILDING CODE (IBC) AS ADOPTED AND MODIFIED BY THE 2012 USBC; THE 2011 NFPA-70 (NATIONAL ELECTRICAL CODE, OR NEC); AND OTHER RELATED CODES AND STANDARDS. THE COMPLETED INSTALLATION SHALL COMPLY WITH THE ADAAG "AMERICAN WITH DISABILITIES ACT GUIDELINES FOR BUILDINGS AND FACILITIES". WORKMANSHIP SHALL MEET THE "STANDARDS OF INSTALLATION" AS PUBLISHED BY THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA).
3.

PERMITS AND FEES: OBTAIN PERMITS, BONDS, LICENSES AND INSPECTION CERTIFICATES. PAY INSPECTION FEES AND TAXES. FILE PLANS AND PREPARE DOCUMENTS REQUIRED TO OBTAIN APPROVALS OF GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.
4.

CONDUIT: PROVIDE RIGID GALVANIZED STEEL CONDUIT (RGS) OR SCHEDULE 40 PVC CONDUIT UNDERGROUND AND IN CONCRETE SLABS. PROVIDE RGS WHERE ABOVE-GRADE EXTERIOR AND ABOVE-GRADE IN THE ENCLOSED BAY OF THE POLE BARN. INSIDE THE EXISTING BUILDING WHERE ABOVE-SLAB, PROVIDE ELECTRICAL METALLIC TUBING (EMT) FOR EMPTY CONDUIT RUNS AND STUB-UPS AND PANEL FEEDERS; ALL CONDUIT STUBS SHALL HAVE BUSHINGS. PROVIDE GALVANIZED SINGLE STRIP FLEXIBLE CONDUIT, MINIMUM 18" LONG, FOR MOTOR CONNECTIONS. CONDUIT SHALL BE MINIMUM 1/2", EXCEPT SHALL BE MINIMUM 3/4" WHERE UNDERGROUND OR IN SLAB. SUPPORT CONDUIT AS REQUIRED BY THE NEC. EXPANSION/DEFLECTION FITTINGS SHALL BE PROVIDED WHERE REQUIRED PER NEC 300.5(H). FOR UNDERGROUND CONDUIT, PROVIDE SEALS WHERE REQUIRED PER NEC 225.27 AND 300.5(G). FITTINGS SHALL NOT BE CAST POT METAL.
- ALL CONDUITS PASSING THROUGH RATED WALLS OR CEILINGS SHALL BE SLEEVED AND PACKED WITH U.L. LISTED SEALANT TO MAINTAIN RATING.

TYPE AC, MC AND NMC CABLE ARE NOT ALLOWED.
5.

JUNCTION, OUTLET AND PULL BOXES: PROVIDE JUNCTION, OUTLET AND PULL BOXES FOR WIRING DEVICES, FIXTURES, CONNECTIONS TO EQUIPMENT AND AS REQUIRED BY THE NEC. BOXES SHALL BE STEEL UNLESS REQUIRED OTHERWISE BY ENVIRONMENT.
6.

HANGERS AND SUPPORTS: PROVIDE ALL HANGERS, SUPPORTS, ANCHORS, SLEEVES AND SEALS AS REQUIRED BY THE NEC.
7.

WIRING: PROVIDE COPPER CONDUCTORS, THHN OR THWN, 600 VOLT, MATCH EXISTING BUILDING WIRING COLOR-CODING. NUMBER 12 AWG SHALL BE THE SMALLEST SIZE WIRE USED FOR POWER AND LIGHTING. FOR 120-VOLT 15 AMP AND 20 AMP BRANCH CIRCUITS, USE MINIMUM 12 AWG UP TO 60 FEET, 10 AWG FOR 61-95 FEET, 8 AWG FOR 96-155 FEET AND 6 AWG FOR BRANCH CIRCUITS LONGER THAN 155 FEET; CONDUCTORS SHALL BE SAME SIZE FOR ENTIRE LENGTH OF RUN. CONDUCTORS 8 AWG AND LARGER SHALL BE STRANDED; CONDUCTORS 10 AWG AND SMALLER SHALL BE SOLID. WIRING SHALL BE RUN CONCEALED, EXCEPT WHERE INDICATED OTHERWISE ON THE DRAWINGS. DO NOT INSTALL A SHARED NEUTRAL ON ANY CIRCUIT. FOR LIGHT SWITCHES, INSTALL NEUTRAL CONDUCTOR WHERE REQUIRED BY NEC 404.2(C). ALL TERMINATIONS SHALL BE 75 DEGREES C.
8.

GROUNDING: PROVIDE AN EQUIPMENT GROUNDING SYSTEM INSTALLED TO METALLIC STRUCTURES, ENCLOSURES, RACEWAYS, JUNCTION BOXES, OUTLET BOXES, PULL BOXES, MACHINE FRAMES, PORTABLE EQUIPMENT AND OTHER CONDUCTIVE ITEMS IN CLOSE PROXIMITY TO ELECTRICAL CIRCUITS. ALL BRANCH AND FEEDER CIRCUITS SHALL INCLUDE A GREEN GROUNDING CONDUCTOR. PROVIDE GROUND BUS IN ALL PANELBOARDS.
9.

IDENTIFICATION: WHEREVER REASONABLY REQUIRED FOR SAFETY, MAINTENANCE AND/OR OPERATIONAL PURPOSES, PROVIDE SELF-ADHESIVE PLASTIC SIGNS FOR IDENTIFICATION, INSTRUCTION OR WARNING ON SWITCHES AND OUTLETS, AS WELL AS OTHER CONTROLS, DEVICES AND ENCLOSURE COVERS. PROVIDE A DANGER SIGN WHEREVER IT IS POSSIBLE FOR PERSONS TO COME INTO CONTACT WITH A VOLTAGE HIGHER THAN 120 VOLTS, AS WELL AS ON CRITICAL SWITCHES AND CONTROLS WHERE UNTIMELY OPERATION COULD BE A SAFETY HAZARD. PROVIDE AN ENGRAVED PLASTIC-LAMINATE LABEL ON EACH MAJOR UNIT OF ELECTRICAL EQUIPMENT, INCLUDING BUT NOT LIMITED TO: PANELBOARDS, ENCLOSURES, AND DISCONNECT SWITCHES. EQUIPMENT LABELS SHALL INCLUDE WHAT IS REQUIRED IN NEC 408.4(B). ENCLOSURE TYPES SHALL BE MARKED PER NEC 110.28.
10.

CONNECTIONS TO EQUIPMENT: MAKE FINAL ELECTRICAL POWER CONNECTIONS TO MECHANICAL EQUIPMENT. PROVIDE CONDUITS, OUTLET BOXES AND POWER WIRING FROM THE POWER SOURCE TO THE MOTOR OR EQUIPMENT JUNCTION BOX, INCLUDING WIRING THROUGH STARTERS OR SAFETY SWITCHES, IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
11.

WIRING DEVICES (SHOP DRAWINGS REQUIRED): WIRING DEVICES SHALL BE BLACK AND SHALL BE INDUSTRIAL SPECIFICATION GRADE. SWITCHES SHALL BE TUMBLER TYPE, 20 AMP; LIGHTING, GROUNDED, RATED 120/277 VOLT, WEATHERPROOF WHERE INDICATED, EXCEPT WHERE NOTED OTHERWISE ON THE DRAWINGS. RECEPTACLES SHALL BE NEMA 5-20R, GROUNDED. GFCI TYPE DUPLEX RECEPTACLES SHALL BE RATED 5 MILLIAMPS, AND SHALL BE READILY ACCESSIBLE WHERE REQUIRED BY NEC 210.8. WIRING DEVICE WALLPLATES SHALL BE SATIN STAINLESS STEEL AND SHALL BE BY SAME MANUFACTURER AS WIRING DEVICES. WEATHERPROOF COVERS SHALL HINGE FROM TOP, SHALL BE LISTED AS WEATHERPROOF WHEN IN USE AND SHALL BE "EXTRA DUTY" WHERE REQUIRED BY NEC 406.9(B)(1), AND RECEPTACLES IN THESE COVERS SHALL BE LISTED AS WEATHER-RESISTANT TYPE.

WIRING DEVICE MANUFACTURER SHALL BE BRYANT, EATON ARROWHART, HUBBELL, LEVITON OR PASS & SEYMOUR.
12.

PANELBOARDS (SHOP DRAWINGS REQUIRED): PANELBOARDS SHALL BE DEAD-FRONT, COPPER BUS, WITH THERMAL MAGNETIC MOLDED CASE CIRCUIT BREAKERS IN ACCORDANCE WITH SCHEDULES SHOWN ON THE DRAWINGS. BREAKERS FOR APPLIANCE PANELBOARDS SHALL BE BOLT-ON. SERIES RATING IS NOT ACCEPTABLE. WHERE NON-INSTANTANEOUS TRIP BREAKERS ARE USED, FOLLOW NEC 240.87. PANELBOARDS SHALL HAVE TYPED, FRAMED CIRCUIT DIRECTORIES. THE CIRCUIT DIRECTORIES SHALL INDICATE THE LOAD TYPE AND THE OWNER'S ROOM NAMES/NUMBERS (NOT THE CONSTRUCTION DOCUMENT ROOM NAMES/NUMBERS). DOORS SHALL HAVE LOCKS AND BE KEYED ALIKE. EMPTY SPACES SHALL BE FULLY BUSSED WITH HARDWARE FOR FUTURE BREAKERS.

MANUFACTURER SHALL BE SQUARE D, GENERAL ELECTRIC, EATON OR SIEMENS.
13.

LIGHTING (SHOP DRAWINGS REQUIRED): PROVIDE FIXTURES AS INDICATED ON THE DRAWINGS. MANUFACTURERS SHALL BE AS INDICATED ON THE DRAWINGS OR EQUAL. FIXTURES SHALL BE COMPLETE WITH REQUIRED SOCKETS, WIRING, GLASSWARE, REFLECTORS, HANGERS, FITTINGS AND MOUNTING TRIM. FIXTURES SHALL BE CLEANED AND COMPLETELY LAMPED. PROVIDE PROPER TRIM, FRAMES, MOUNTING DEVICES, CONFIGURATION AND ACCESSORIES REQUIRED TO PROPERLY INSTALL FIXTURES IN THE BUILDING CONSTRUCTION.

CATALOG NUMBERS OF FIXTURES SCHEDULED ARE TO ESTABLISH A TYPE OF FIXTURE, NOT TO DETERMINE A METHOD OF MOUNTING. VERIFY CEILING CONSTRUCTION BEFORE ORDERING FIXTURES, AND PROVIDE MOUNTING TRIM SUITABLE FOR THE CEILING FINISH IN WHICH FIXTURE IS INSTALLED.

ALL DRIVERS SHALL COMPLY WITH NEMA 410-2011 FOR INRUSH CURRENT.

REVISION	DATE

SYCAMORE AVENUE POLE BARN
ELECTRICAL AND HEATING
ROANOKE, VIRGINIA

ELECTRICAL SPECIFICATIONS

DESIGNED JTO/RGW	DRAWN JTO/RGW
CHECKED RWH	APPROVED LPA
COMM. NO. 16101.21	DATE 06-03-16
SHEET ME-2	